UNBOUND NOTES AND DRAWINGS

UNDATED DRAFTS OF CAVEATS AND PATENT APPLICATIONS

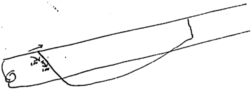
Take about 2 qrts Boiled Linseed oil Boil it down so it gets thick like heavy Molasses – Then take $\frac{1}{4}$rd of whole out, Continue boiling till it gets very thick take another $\frac{1}{4}$ out then boil & stir to prevent burning till it gets nearly solid – take another $\frac{1}{4}$ out boil balance till it gets like india rubber it will suddenly get this way tough & tenacious – take it off before burning – The last 2 $\frac{1}{4}$ especially the last try and find a solvent hot or cold

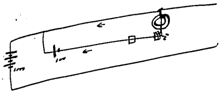
TAE - bounds

Dyer - Patent =

The object of this invention is to increase the economy of Systems of Electric Lighting employing transformers -

The invention consists of main distributing wires with ~~tran~~ the secondary coils of all the transformers on that particular circuit connected in Multiple arc while ~~the~~ the primary wires of one or more transformers are connected to the Central Station by separate wires for instance if there is a main circuit of one mile in length and twenty transformers connected there with all the Secondary Coils are connected across ~~by~~ the same in multiple arc while the 1st. 10th & 20th transformer have ~~these~~ end of the ~~sec~~ primary connected to a wire running to the

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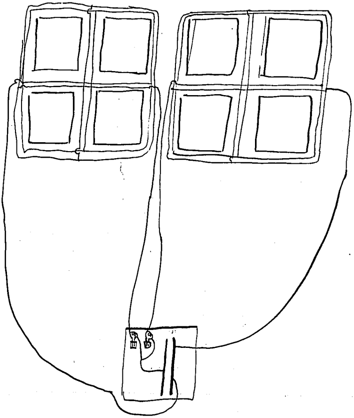

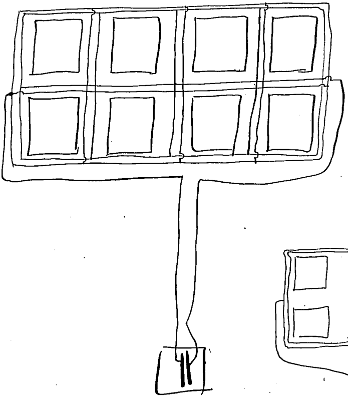

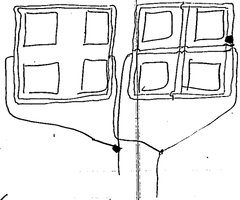

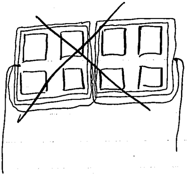

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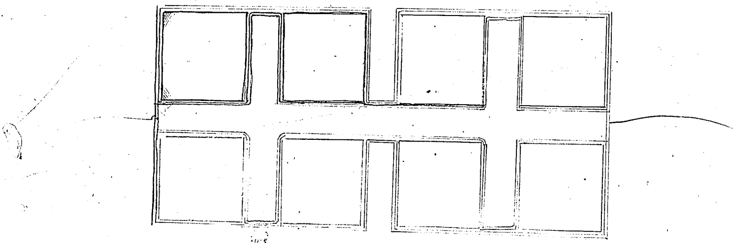

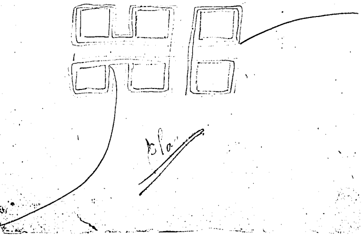

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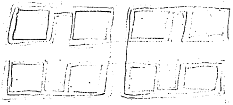


Object of the invention

Manufacture Carbon conducting ~~filaments~~ of pure dense Carbon artificially

Value invention, production of high Candle power lamps

The invention consists in establishing an Electric arc between two poles of a battery or dynamo. when the same are immersed in a liquid or gas which is decomposed by heat into Carbon such as Hydrocarbon oils or carbon combined with other Elements and maintaining the size of the arc constant while Carbon is being deposited continuously on one of the poles in the form of a ~~ch~~ ~~filament~~ thin stick. Upon the establishment of the arc between g & X a deposit of Carbon takes place on X and if ~~the~~ X is gradually

draw away from g by the screw motion so as to maintain the arc carbon will be continually deposited on X in the form of a round stick about the size of X. and this will continue as long as the arc continues so ~~that~~ sticks of round homogeneous Carbon can be made ~~of so~~ several inches in length, When the required length is obtained the stick is broken off & placed in suitable Clamps and a ~~fil~~ thick deposit of Carbon made on the End in any of the various ways shewn in my previous patent,

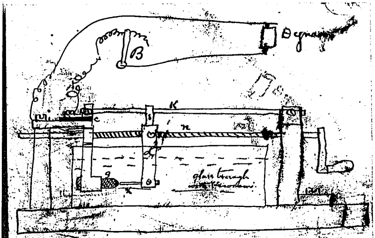
Instead of the trough containing the liquid the apparatus may be arranged in a chamber containing through which gas passes the Mechanism for giving motion being ~~caused~~ ~~thus~~ put in motion by a rod through a stuffing box in the

Chamber;

It is obvious that expanding Conductors may be made in Spiral or any form by suitable mechanism.

Broad Claim on new article Mfr

you notice the means starting filament to deposit on but is [illegible] entirely of Carbon from decomposition of a liquid or gaseous body Containing Carbon.



x platina
g Carbon
n Screw
d travelling holder carried by n
S guide fork
K guide.
c insulation.
B adjustable resistance

The object of this invention is
to drive out the moisture ~~of~~
from the globe of an incandescent
lamp

The invention consists in
heating the globe of the
lamp either before Exhaustion
to a very high temperature
or heating it while being
Exhausted to a high temperature

When the Lamp is to be heated
before exhaustion it is heated
Equitablely over a flame
and then immediately sealed
thus maintaining an atmosphere
free of moisture within the
globe until it is to be exhausted
when the tip of the sealed
portion of the exhausting tube
is broken off and ~~it~~ it then
put on the pumps, after being
put on the pump it should be

again heated so as to drive out any moisture which might have passed into the globe while connecting to the pump, In this way the phosphoric anhydride used for drying is economized ~~and the first part of the vacuum obtained more quickly expensive~~ and a better vacuum is attained,

Claim The method of driving out vapors from the globes of incandescent Electric Lamps by heating the same to a high temperature, separately or before and in the act of exhausting the same for the purpose set forth, R.R Electric (1872)

Figure 1

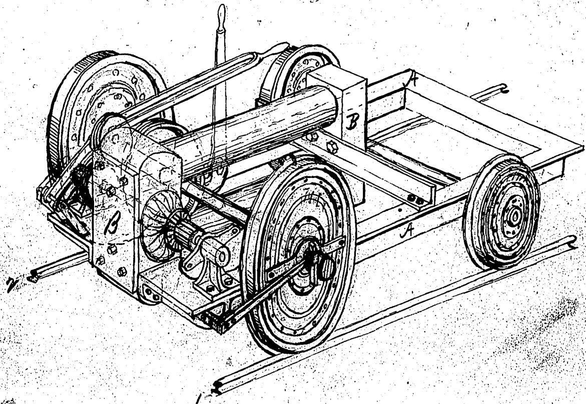
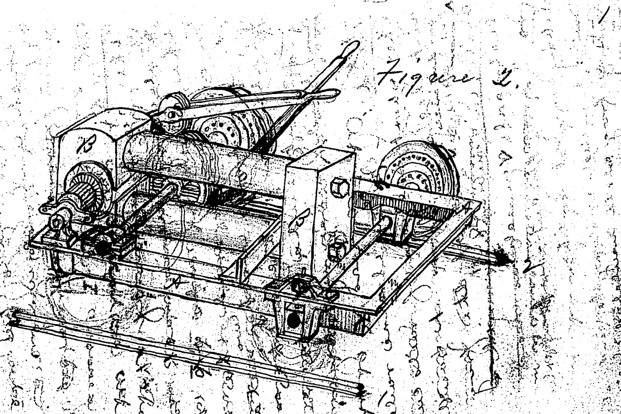


Figure 2.



a

Object to make a better contact between the clamps and the Carbon,

Attained by electroplating the thickened ends with Copper Silver Nickel Cobalt or other easily plated metal which will stand elevated temperatures such as 800 deg fahr or upwards,

When the metal is plated on the carbon It fills every interstice ~~and~~ thus making perfect Contact, as the metal in plating Contracts and puts great pressure on the Carbon after the metal has been plated heavily, It can be clamped very tightly without breaking or cracking the thickened end of the flexible incandescent conductor,

The top cell shows the plating of both clamps at once the thickened Ends only being in Contact with the liquid

The Second figure shows the plating of one End at a time,

Claim Plating with nickel or cobalt,
" plating the Ends of an incandescent ~~flexible~~ carbon conductor Etc

2 lamps same circuit;

The object is to effect a subdivision of a standard jet of 16 candles into two or more forming one derivation whose radiating surface & resistance shall be such as with a Constant pressure or Electromotive force will together give 16 candles or 8 each or when a greater number are placed in one derivation the total Resistance and total radiating surface of the whole shall not exceed the total resistance and radiating surface of a single standard lamp =

In this Case where two or more lamps are included in one derivation, I use a single circuit breaker, so that all are turned off at the same moment, I have shown a socket combination of two lamps and one circuit Breaker,

want strong claims

The Use of a nonmagnetic metal or substance to seperate the lower polar Extremities + the yokes of the field magnets from the iron base — for the purpose set forth

Claim the Use of a number of these in Multiple arc,

Mention

The Use of small sizes connected as a dynamo machine the Steam Engine being provided with a governor whose speed can be regulated at will so as to increase or decrease the speed of the Engine & motor at will for the purpose of Energizing the field of force magnets of a number of larger magnetos ~~[illegible]~~ Connected in Multiple arc in the light system, the increase or decrease in speed causes a rise & fall of EMF in the Multiple arc system, B Claim,

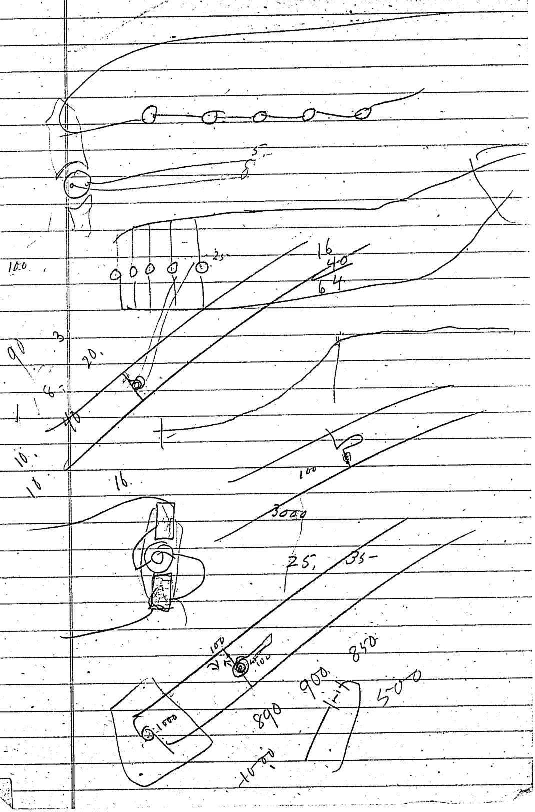
a Series of seperate Electromagnets arranged with one induction bobbin within their polar faces,

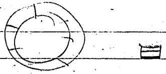
done by Hammer on one mag but it was steel arc

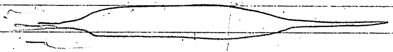
One or a series of electromagnets with an induction bobbin ~~with~~ rotatable within their polar faces, one or the whole of the upper polar faces being fastened ~~to~~ the lower polar faces by a ~~plate~~ non magnetic plate,

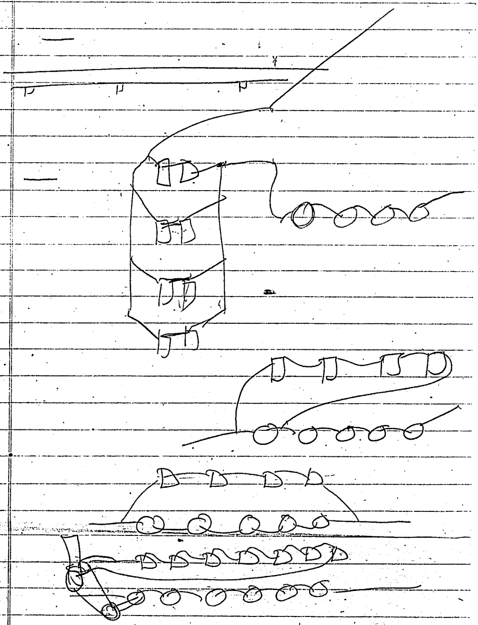
The combination with the shaft of a magneto electric ~~mag~~ machine, of a wheel or crank to which the ~~crank~~ pitman rod of a steam Engine is secured, when such wheel or crank is arranged with a balance to balance the Effect of the reciprocation of the pitman rod

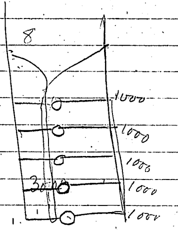
The Combination directly with the shaft of a Magneto Electric Machine of ~~a~~ high speed steam Engine provided with an automatic variable cut off governor, all arranged & combined & operated together upon one common base —







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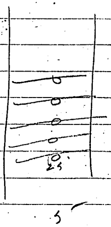
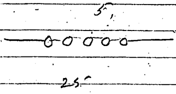




No7=

Transfer power, x water wheel

~~Over~~ To transfer power by means of Electricity for great distances, ~~requiring~~ without the erection of costly Conducting wires requires that, the Current sent should be of very high Electromotive force, as much as 2800 to 3000 volts, by the use of these high Electromotive force a ~~[illegible]~~ surprisingly small wire may be made to Carry without Material loss several hundred horse power for several miles, In practice it is practically impossible to develope Current of such high Electromotive force from a single Bobbin of a machine, as ~~it is liable to be crossed~~ the difference of potential between one section of coil, & another upon the bobbin is so great that dampness causes Currents to break a path & cross & burn the Machine, another difficulty is that the spark at the Commutators is increased, By ~~dividing~~ Constructing the Machine so that it is provided with several bobbins ~~& field magnets [illegible]~~ upon one shaft which is rotated by steam water or other power, The difference of
OVER

2 potential between the poles of each bobbin is lessened the total EMF being divided between the bobbins, hence there is a less potential between each layer of wire on each bobbin, - By thus distributing the Electromotive force in several bobbins all driven directly by a ~~sing~~le shaft. It becomes possible to ~~carry~~ translate several thousand horsepower into Electricity and carry the same over a very small wire to the distant station,

To Energize the field of force magnet a shunt is arranged around one of the bobbins of the machine [illegible] the wire upon all the field magnets forming a part of the shunt The resistance of the field magnet wires is so proportioned that only sufficient Current passes through the wire to Energize the field magnets to that point of magnetic saturation that is the most economical in relation to the Current, It is obvious that one of the bobbins

May be entirely disconnected from the main line and the coil so proportioned upon it that it will give sufficient current to energize all the field magnets;

At the receiving station the ~~apparatus~~ machine is composed of several bobbins and ~~its~~ field of force magnets energized by a shunt as at the receiving station, or a separate bobbin may be disconnected from the line & the current used from it to energize the rest of the field magnets,

I have found that the receiving Motor should have its bobbin wound to give one half ~~or~~ less Electromotive force as the transmitter when both are driven as transmitters ~~so that~~ ~~when the Receiver~~, for in that case the Receiver must run at nearly twice the speed ~~or more according to the~~ of the transmitter when doing no work, and when doing its work ~~at the ba~~ economically running faster or as fast as the transmitter

It has been the practice heretofore to make the receiving machine ~~quite the so~~ exactly

over

(Mention that ~~when a water wheel is used~~ ~~and the~~ it is necessary when a water wheel is used as the wire must pass through the field with great rapidity to [illegible] the keep[illegible] either to make the bobbins of great diameter so that a ~~sup~~ high surface speed is attained with a slow shaft rotation.)

4

Like the transmitting machine, adding such work to it that it gives half the speed or 2/3 of the transmitter, the contrary electromotive force it gives the maximum effect, but not the most economical effect, ~~but if the~~ I have attained this principle inasmuch as I ~~make the machine~~ wind the bobbins so that it must run twice the speed ~~to give~~ as the transmitter. and add work sufficient to bring the contrary electromotive force up to 75 or 80 per cent of the electromotive force of the transmitter.

Notes by [illegible]

Edison's [illegible] early [illegible]

I will mention that at the Receiving station that the machines may be divided up and placed at different points but all of its bobbins connected in series. When the machine is divided up a separate small bobbin & field magnet worked as a dynamo is to be connected & driven by the main shaft which is driven by the bobbins in the main line. This separate bobbin as before mentioned is to energize the field of force magnets of the main line bobbins.

~~Say that a very small induction bobbin & small field magnet, may be arranged so as to~~

Say that upon the same shaft as the large bobbin a small subsidiary induction bobbin may be placed with its subsidiary field magnets connected as a Dynamo the whole current of which is made to pass through the large field of force magnets to keep the ~~E~~ Electromotive force of the Large Induction bobbin Constant

~~Therefore~~ We form the Induction bobbin on an iron or steel sleeve or tube which is slipped over the Engine shaft & keyed or otherwise fastened to it

The Combination ~~use of~~ a induction Bobbin of a magneto Electric machine with an auto variable cut of Engine rotating the shaft upon which the bobbin is placed and so proportioning the size and weight of the bobbin & the speed of the Engine that the former will act as a fly wheel with the best Effect

Say that the wire ~~bobbin~~ coil ~~wires around~~ one of the field magnets may be connected in series with the wire coils of the other field magnets or the whole of the coils may be connected in Multiple arc

Claim,

Several bobbins & their field force magnets, on one shaft,

2" Energizing the field magnets ~~by all~~ of the several bobbins by a derivation from one bobbin,

3rd proportioning the Resistance & Convolution of all the field of force magnets so that with the constant Electromotive force of one bobbin that ~~the~~ Current will flow through all the field of force magnets to saturate the magnetically to the most economical point,

4 The Use of a distinct & separate bobbin disconnected from the main line by rotated in the same shaft.
other bobbins to Energize its
all the other field of
nets,

claim abnormally great diameter
hat the cutting speed of the wire
shall be great while the shaft
relatively slow as when a c

TAE

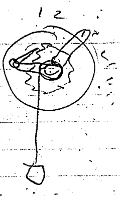
6.
The method of obtaining a rapid
rotation of the shaft by using a
slow moving water wheel to
pump water to a higher level
to fall on a ~~very~~ quick revolving
turbine connected to the shaft of
the Electric machine,

7. ~~The method use of a receiving~~
~~in~~ In a system of transferring
power by Electricity The use
of Receiving motors, which shall
give a lower Electromotive force
~~when rotated~~ than the transmitter
when rotated at the same speed,

8. ~~The~~ In a system of transferring
power by Electricity the use of
Receiving motors with a load
so proportioned that it shall
not ~~exceed, a po~~ cause it to
be reduced in speed ~~by~~
below a point where it w
give a counter Electromotive
of at least 60 per cent.
of the transmitting

~~9. The method of Ex~~
~~the field of force~~
~~of the receiving [illegible]~~
~~[illegible] the [illegible] sk.~~

Remaining motors to rotate a
Seperate bobbin which bobbin
Energizes its own and all
of the other field of Beven
magnets,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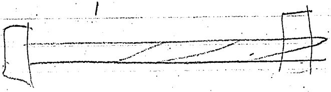

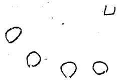

1

Case AA-

The object of this invention is to ~~regulate~~ Energize the field of force magnets of a series of ~~Dynamo~~ Faradic Machines and to regulate the amount of Energy given to such ~~Dyn~~ Faradic Machines

The invention consists of a Dynamo machine, rotated by a steam Engine provided with an automatic variable Cut off governor for supplying Current to the field magnets of a number of Faradic machines,
The invention further consists in providing such governor with a device whereby the speed of such Steam Engine may be increased or diminished at will

A is the steam Dynamo machine, which is provided with a Porter Allen governor X The speed of ~~the~~ Engine being increased or diminished

Case H.H. ②

by increasing or diminishing the position of a weight Q from the fulcrum P. at which point there is a wheel R working a screw S which serves to draw the weight Q to or from P.

The Faradic Machines B C D & E are also ~~steam~~ driven directly by a steam Engine with automatic variable cut-off governor but the governor is not usually made regulable a given number of revolution being decided upon the governor is set to give the exact number. ~~while~~ But owing to the rise & fall of Electromotive force in the main Conductors 1 & 2, due to ~~putting in &~~ connecting & disconnecting lamps & motors it is essential that the ~~same~~ Electromotive force should be prevented from rising or falling beyond a certain point & this is attained by manipulating the governor of the steam Engine of A which in its

Case 44 ③

turn regulate the strength of the magnetic fields through which the bobbins of B C D & E are rotated,

I have shewn the field of force magnets ~~also~~ connected in series ~~But~~ they can also be connected in multiple arc from the Dynamo A.

3, & 4, 5, & 6 are subsiduary ~~[illegible]~~ Multiple arc circuits in a house, 10 is the meter. 7 an Electromotor 8. 9 & 10 Electric Lamps —

Claim.

Regulating the EMF at Central Station by increasing or diminishing the speed of a steam motor ~~by~~ driving a Dynamo, by means of its governor

Etc

Etc

Case K K.

The object of this invention is to measure the ~~electric~~ quantity of Electricity or electric Energy used upon a closed Circuit in any given time.

The invention Consists Suspending by means of a spiral spring an Electrode within a cell containing a liquid such Electrode being preferably of Copper & the liquid of Sulphate of Copper and inserting in such cell another Electrode, Both the Suspended & fixed Electrode ~~being~~ forming the poles of a derived circuit from the Circuit wherein the Energy is to be measured, and measuring the strength and amount of such Energy by the effect of the deposit of Copper taking place on the Suspended Electrode Causing it to move an index finger over a scale after the manner of an ordinary spring balance;

Case KK ②

The invention further consists in causing the downward movement of such suspended Electrode to actuate contact levers for closing circuits containing devices for recording definite increments of deposited Copper — so that a continuous record may be obtained.

A is the Electrolytic Cell. B is a Copper Electrode suspended from the spiral spring D by an arm carrying an index finger E. F is a circuit closing lever closing at G when the deposit on B is at a maximum & on H when the deposit is at a minimum. The amount of deposited Copper being read off from the scale when the arm E is not in contact with F. I is the Apparatus for counting each deposit and for reversing the direction of the flow of the current after the counting takes place,

Case KK

③

~~The~~ K is the Counter. L the lever which serves to work the Counter at each reciprocation, and which also serves to reverse the Current through the depositing Cell by the usual current reversing device O.

P. Q. are the main wires. ~~The Energy of [illegible]~~ the Current circulating in which is to be measured. ~~The operation~~ R is a Coil which is given such a resistance that only a ~~fr~~ definite fraction of the Current passing will be deflected through the Meter. 4 + 5 are the wires leading to the reversing spring ~~or~~ s. t. & u are the other poles which are connected to the Electrodes B C by the wires 2, & 3. ~~The wire~~ When the lever L is on one side the Current passes through the Cell in one direction while if its is on the other side the

Case KK.

(4)

Current passes through the
Cell in the opposite direction.

S is a Resistance to weaken the current passing from the main line through the actuating magnets M.N. the other Ends being 8.+7 which passes to G + H respectively while the other portion of this circuit is formed by the arm E + wire 1. The operation is as follows When the lever L is in such a position that the current is from ~~C to B~~ the Electrode C towards B. Copper is deposited upon B and it gradually passes downward in the liquid by the increase of weight when it reaches downward near the limit of its motion the arm E strikes the lever F + carries it in Contact with the point G. This Closes the circuit through the magnet N. for an instant the lever L is drawn over to the other side the direction of the flow of the

Case KK ③

Current through the cell being reversed so that Copper is taken off of B & deposited on C. this lightens B & it rises ~~& the levers~~ until the lever F places the lever F in contact with the point H. when the Current is again reversed by the magnet M being Energized and the Electrode B again receives a deposit & sinks & this goes on incessantly = ~~Of~~ Every movement or reversal being Counted by the action of the lever L upon the Counter K.
~~Knowing the amount of Current [illegible] to the main Circuit~~

R.R. is a resistance of Copper wire of such an amount that it will increase its resistance to the passage of a Current by rise ~~of~~ temperature in the same proportion as the Electrolytic fluid decreases its resistance for such rise or vica versa when there is a fall of temperature fig 2 shews a plain indicating meter useful where but one or two lights are used, ~~The Resistance~~ the two Electrodes being connected directly to the Ends of the Resistance R. ~~which w~~

Claim.

Cant say in view of our previous Case —

Case LL.

The object of this invention is to ~~prevent~~ modify the action of momentary currents of higher Electromotive force than that normally present in my system of distributing light & power from Central Stations

It has a further object in preventing as far as possible the blackening of the glass vacuum chamber ~~of~~ containing the incandescing filament by Carbon deposited thereon by Electrical Carrying

The invention consists in protecting the lamp against higher momentary Electromotive force by putting a Condenser across the multiple arc circuit between ~~that~~ lamps in Each house & the main conductor

The invention further consists in placing on the socket or holder of Each Electric

Case LL ②

Lamp a short ~~po~~ magnet ~~of~~
presenting such polarity ~~to~~
~~upon the side of the~~ the positive
side of the carbon filament
that it will attract the
highly Electrofied Carbon
Vapor downwardly to the
Clamps instead of allowing
it to be deposited upon
the glass This it will do as
an exceedingly weak magnet
will deflect it the stream of Electrified Carbon in any
required direction.

In fig 1 is shewn the
main Conductors A.B.
with two wires e d leading
from the service 60x C.
the wire e passes through
the Meter E across the
wires d & e is placed a
Condenser. P. which serves
to absorb ~~focus~~ or reduce
the Rise of Electromotive force
The condenser might be
replaced by a Secondary
battery The Lamp G.
shews a magnet N.S.
attached to one side of

Case LL ③

of the glass chamber

This is more clearly shown in fig 2 N. S. is the bar magnet placed on that side of the carbon filament connected to the positive pole, I will mention that a coil of wire with a current passing through the same will attract or deflect the stream of Electrified carbon

Claim.

The Condenser or Secondary battery for the purpose

The Use of a magnet in connection with an incandescent Electric Lamp for modifying or Effecting the action of Electrical Carrying

Edison gave me some notes on Dynamos, proportions, relations &c, with a view to making an effort to secure claims on abnormally large field magnets

Ideas —

You can claim a Combn " single Electro magnet as described with a cylinder having its surface entirely covered with wire

A field magnet whose weight is 4 or more times greater than the bobbin =

A Magnet formed of Cylinders ~~having~~ of abnormal length & dia with polar extensions such as described in Combn with a cylinder entirely covered with wire;

A magnet whose length is 2 or more times the diameter of the induction bobbin —

A magnet field of low magnetic resistance

over

We should somewhere claim working the field magnet of a Dynamo by including it in a Multiple arc circuit = was 1st do this =

Go claim = would be the Combn with abnormally large field magnets 2 or more times in length than the diameter of the bobbin; of a rotating iron cylinder made of thin discs of sheet iron

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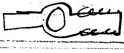
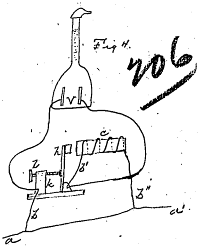
You know all the other fellows us



I use a single pole - Welde used same as me but he had old Siemens armature — & flat magnet not round = prof Rowland says, round magnet give maximum Effect for given Current, EP. 3988 of 78 -

206



"Figure 4 represents the electro-magnetic voltameter; aa' is a portion of the conductor; b b' b'' is a derived circuit in which is the coil of an electro-magnet c. In conjunction with this electro-magnet is an automatic make-and-break piece k. A voltameter v is joined between the set screw l and hammer h or between the points where the contact is made and broken. The action of the apparatus is as follows When a current passes through the conductor a a' there will necessarily be a difference of electro-motive force between the points a and a', the result of which will be that an electric current will be made to circulate through the coil c and magnetize the soft iron core. The hammer h which is attached to a spring will thus be drawn out of its normal position and break the contact at k between the set screw l and hammer h. The hammer will then no longer be attracted, and will fall back to its original position and re-establish the contact, & so on. The voltameter v is, as already stated, joined up between the points of contact. The extra current formed on breaking contact will pass through the voltameter and decompose the water it contains; the quantity of water decomposed will be approximately proportional to the quantity of electricity which has passed through the conductor a a'."

From Prov.

"To shunt off from any given length of the conductor (the amount of electricity passing through which is to be ascertained) a "derived" circuit having a voltameter joined up in it. The resistance of this circuit must be very much greater than that of the length of conductor from which it has been shunted. The resistance of both voltameter and conductor being fixed the quantity of electricity passing through the voltameter will consequently bear a fixed ratio to the amount passing through the conductor. In this manner with a graduated tube the height of a column of liquid can be measured and so the quantity of electricity passed can be ascertained"

Batch + rue Together take this out ① 228

The object of this invention is to produce a rapid vacuum and to provide for a cheap and rapid method of proving the perfection of the Carbon loop before it is finally sealed in the Glass globe of the lamp.

As it is practically impossible to produce slips loops of absolute uniformity or homogeneity or to Carbonize the same absolutely uniform, many ~~have~~ show when heated to redness, spots which are either less red or of a bright red or in cases where there is a bad fault ~~obtain~~ a white incandescence and as these brightest spot determines the life of the lamp, as well as effects its resistance ~~It is becomes necessary to prevent the destruction of so many Completed~~ To prevent these defective Carbons from ~~being~~ Entering as parts of a Completed lamp to be afterward thrown away thus ~~many~~ increasing the Cost of manufacture of the remainder ~~#~~ a ~~previous~~ preliminary heating which can be made rapidly & cheaply this saves this destruction of Complete lamps & reduces the Cost of manufacture —

Q is the glass holder which is subsequently sealed to the glass globe at the bulge R.
a is the Carbon to be proved, ~~[illegible]~~ B is a soft rubber cork. through which the glass holder passes - d is a small bottle holding Mercury. Connected to the neck of the tube C. by lowering this the Mercury passes ~~[illegible]~~ into the neck & overflows the cork thus sealing it & preventing egress of air to the chamber C

Fig 2 shows the Complete apparatus - a is the Carbon C the chamber. X is a stop Cock closing a tube which connects with a large Exhausted chamber f. having a Capacity many times greater than the chamber C. This chamber is kept at a high exhaustion by the Sprengel drop tube H. There being several of these connected to f. These drop tubes get their Mercury from a pipe K leading from a reservoir & the Mercury falling passes in a tube P leading to a Mercury well, The Hg of the well being pumped back

(over)

~~by these~~ to the high reservoir by steam or other power by means of a pump =

N is a McLeod gauge for measuring the degree of exhaustion an apparatus which has been described in other application made by me relating to this subject —

[illegible] after the Carbon holder with its cork has been placed, in the Chamber C the cock x is turned and the air rushes ~~into~~ the Exhausted Chamber, f producing still a fair Vacuum in both sufficient to allow of the immediate raising of the Carbon to redness by the current, when the carbon is proved the cock is turned and the several Sprengel bring the vacuum up to its original Exhaustion by the time another Carbon & holder is inserted in the Chamber C.

Claim; proving Carbons before final manufacture lamps =

The Exhausted chamber with a number Mercury pump in Combin with the Chamber to be Exhausted - The stopcock &c,

The object of this invention is to obtain manufacture ~~Conductor~~ strips of ~~[illegible]~~ ~~a~~ woody fibre in proper shape for Carbonization for use as incandescent conductors for electric Lamps,

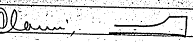
Woody fibre with parallel fibres such as Cane Bamboo or bast fibre from the leaf of the Palm works the best in this machine, strips are Cut larger & thicker than desired from the bamboo cane, and these are drawn through the apparatus fig 1 h is the strip x the Shaving Knife g the guiding Edge, & n the limiting screw which abuts against W ~~[illegible]~~ this screw is adjustable and can be so set that the strip can be accurately shaven to any required thickness, accuracy in sizing is very Essential to attain an equal resistance as a whole radiating surface & uniformity of resistance along the Entire length when the slip is Carbonized. After the strips have been sized as to thickness, they are placed Edgewise in the ~~[illegible]~~ bottom of steel Cutting tool fig 4 and the ragged Edges shaved off so as to come flush with the face of the steel holder along its Entire length. It is then taken out and the straight Edge is placed downward ~~in~~ on the top of the steel tool & shaved so that the slip has thickened ends the finished

Over

strip is shown in fig 5. the slots on the end are for the purpose of holding the ends of the ~~strip~~ filament in the carbonizing mould, a hole may be substituted, a wire being placed in the slit or hole - The hole after carbonization is ~~[illegible]~~ convenient for the screw of the clamp to pass through. If the ~~carbon~~ filament is to be very thick ~~I sometimes draw the~~ It is necessary to have the ends thicker than the body of the filament as well as wider to obtain this result is draw the slip through the shaving machine fig 1 twice or thrice as thick as I intend the filament to be ~~after carbon~~ I then cut it as before described but in this case ~~it will be~~ the filament will be twice or thrice as ~~thick~~ wide as broad, to bring it square I lay it flat in another cutter exactly similar to fig 4, ~~but~~ & shave it flatwise the bottom upon which the slip lays being less deep than in the regular cutting machine. It is obvious that the bottom edge of fig 4 may be of any shape. the top edge of 4 is any shape [illegible]

clamping [illegible]

Mention that care must be taken to cut the filament parallel with the fibre

Claim;  that kind of an end

2nd ~~Bamboo~~ filaments made of Bamboo or Cane family or the fibre of leaves, or other woody material ~~[illegible]~~ whose fibres are parallel, =

3rd - The Method of accurately sizing by shaving -

4 The method of cutting fibre in shape by ~~Cutting in~~ shaving in ~~steel~~ the holders,

5 a ~~Carbo~~ filament provided with a slot or hole in the End for holding the End stationary while being Carbonized & for allowing the screw of the clamp to pass through when ~~Carbonizing~~ placed in the lamp; ~~[illegible]~~

6 The Ends having a greater width & thickness than the body of the filament,

7 Cutting filaments parallel with their fibres.

The object of this invention is to produce filments of carbon of ~~sufficient~~ uniformity in shape and of equality in Carbonization, Nickel plates are used within which are grooves, into which the ~~[illegible]~~ filment of wood is placed, ~~&~~ In fig one. The Enlarged End of the filment is secured to the plate at X by means of a platina pin passing through a hole in the Enlarged End of the filment, a ~~wood~~ wedge a is also placed beside of the End of the filment the platina wire passing through both, The other End of the filment is secured to a nickel or platina Clamp C and rests in the bottom & at the extremity of an Enlarged part of the groove When the Nickel plate ~~so as~~ is covered by another nickel plate, placed in a Nickel chamber & subjected to ~~[illegible]~~ low heat suffient to nearly Carbonize the filment. the whole greatly contracts in length and as the End at X cannot move the ~~clamp~~ End secured to the clamp C is drawn inward until this End is opposite that at [illegible]

(over

The exact position to place the end x so that in the contraction by carbonization the two ends shall be exactly opposite when fully carbonized is a matter of experiment and depends ~~up~~ greatly upon the nature of the carbonizable material in this plate the filament is carbonized edgewise, in fig 4 the two ~~ends~~ thickened ends are laid flat in the grooves & small weights are placed thereon to keep them down, ~~an~~ ~~contraction~~ chamber C is provided in which the filament d can contract, which it does nearly approaching f -

Fig 4 is a modification of the plate shewn in fig 1 except the ends are laid flat instead of ~~[illegible]~~ edgewise, a small weight being placed on the ~~[illegible]~~ lower end & the upper end prevented from moving by being fitted into a space of the size & shape of the thickened end

In fig 8 & 9 the ~~Cont~~ filament is laid flatwise and are covered in held in place by two weights. The filament itself is held in place by a weight ~~fig 9~~ X. when the ~~[illegible]~~ filament contract.

It moves the weight X towards the End of the plate B. The Effort of the filament to move this plate Causes a tension to be placed on it while Carbonizing hence the resulting loop is perfect in shape

If the filament is very thick The Ends may have holes through them as in fig 1, 2, and a pin passed through them securing them to the plate & heavier weights used to keep the Ends perfectly flat which is Essential to effect perfect~~ing~~ ~~clampin~~ Electrical Connection between the clamps in the lamps and also to prevent the breaking of the Ends ~~of the~~ by the clamps should they not be flat =

Claim, The method herein described of manufacturing uniform ~~wooden~~ Carbon Conductors for Electric Lamps, by securing one end in a definite position ~~in relation to the amount of~~ Contraction so that the other End shall when the whole is carbonized be opposite the other

TAE

2 = The method of Keeping
the Enlarged Ends of the
filiments flat when carbonized

3rd The method of Carbonizing
filiments of Carbonizable Material
under tension so as to secure
a Carbon Conductor of uniformity

4 The method of Carbonizing
filiments by placing them
in grooves in metal,

Etc,

A — Case 242

Object is to obtain an incandescent lamp (with a flexible Carbon of high Resistance) for give light in a line (i.e.) a long narrow line of light,

The invention Consists of a long straight flexible carbon secured to clamps which are connected to wire which ~~are~~ pass~~es~~ through & are sealed in the glass and a glass upright within the vacuum chamber for supporting the upper part of the carbon filiment)

The wire passing to the upper part of the carbon filiment is secured to the upright by ~~so~~ melting the glass of the upright at intervals, or it may be secured in various ways. The Carbon being flexible will bow out & in ~~[illegible]~~ by expansion & contraction without breaking. Previous [illegible] inventors have used a short inflexible Carbon which generally was destroyed in a short time or the ~~[illegible]~~ contact between the clamps & the Carbon destroyed by the effects

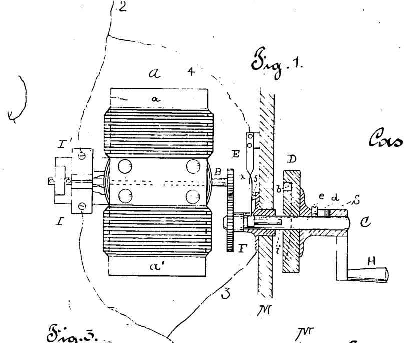
OVER

of Expansion & Contraction ~~whilst~~ ~~heating~~ when~~ever~~ the lamp was lighted.

~~All~~ the diffects of breaking the carbon or ~~makes~~ causing a bad contact ~~them~~ between the clamps & the carbon is entirely obviated by making the same flexible & consequently of high resistance

C

Fig. 1.


2
a
4
a
I'
E
D
B
x
5
b
e
d
S
I
C
F
i
H
a'
3
M

Case 257

Fig. 3.

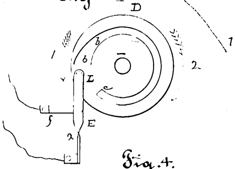
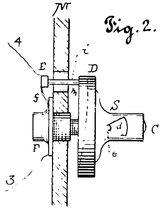

D
b
b
1
2
L
c
f
E
x
1

Fig. 2.


M
4
i
E
D
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d
C
e
F
3

Fig. 4.

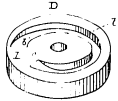
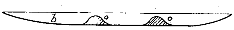
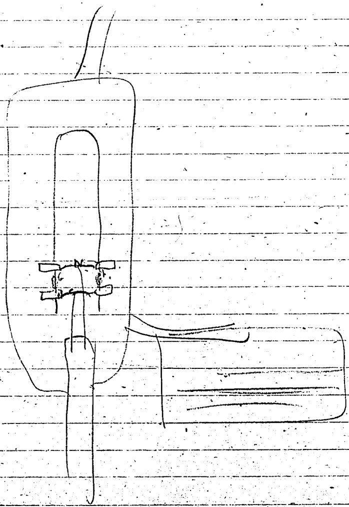


Fig. 5.

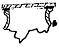


Case
260
1

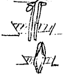


Kirchner — Jelly glass in two glass parts screwed together by moulded thread.

Dalby — Can or jar with loose cover and gasket, ~~are~~ is put in chamber, which is exhausted and then air suddenly admitted. Cover held by at. pres. but may be additionally secured by screw band.



Rayner — Puts lead pipe in stopper of can, sucks out air with mouth, squeezes pipe together, cuts off pipe and then fuses or solders its end.

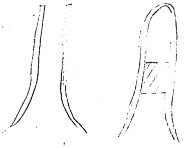


Trissler — Exhausts by pump through lead pipe fused over hole in can top, squeezes pipe together, cuts it off and fuses end.

Hunt — Same as Trissler

Elliot — Fills jar with water, exhausts water and ~~allows~~ uses it to drive a stopper into its seat, which stopper is afterwards made additionally tight by wax.

E.P. 2004 of 74.



Bottle for transporting volatile liquids such as ether. Vessel cooled & filled with ~~ether~~ ether, Cork forced in, and neck fused ~~over~~ together above cork by blow pipe flame.

3/4

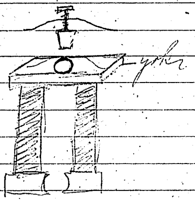
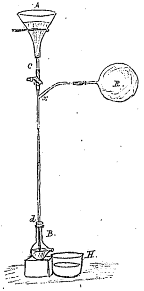
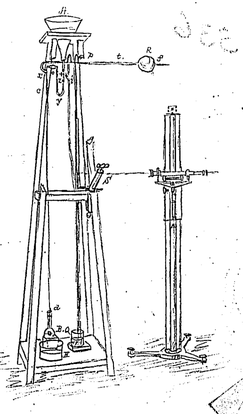


Fig. 1.




A
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R
s
x
e
z
y
a
S
B.Q
H

Case E E ①

The object of this invention is to deposit Carbon at any desirable spot upon a filament of Carbon for lighting by incandescence.

The invention consists of first Exhausting the air by a mercury pump from an Electric Lamp provided with a bulb containing solid Crystals of Napthaline ~~then~~ heating the same after a high vacuum has been obtained so that it will be thrown into the Vacuum in the form of a gas then concentrating by focusing the heat of the sun or an electric arc upon that part of the Carbon filament which it is desired to deposit Carbon If for instance the deposit is required to be made at the clamping Electrodes the focus is placed thereon & the deposit takes place ~~The deposit obtained by this means~~ afterwards the lamp is sealed off and is ready for use.

Case E F. ②

G is the mercury pump.
A the Electric Lamp
D the reservoir of solid Crystals of Napthaline, which may be heated by the lamp
E F is the arc & reflector throwing the rays on the reflector C which focus it upon any desired part of the Carbon. B = The lamp after being finished is sealed off at X. One or two crystals of Napthaline may be placed in the bottom of the lamp to supply the waste of carbon due to Electrical Carrying which it does whenever by long burning of the lamp sufficient heat is conducted from the filament to the glass & downward by Conduction to heat the Napthaline,

Case E E ③

Claim

The method of depositing
Carbon by focusing a source
of Energy —

The Use of Napthalin or
9/6 other Volatile Hydrocarbon Compound
that is ~~not volatile~~ solid
at ordinary temperature

The use of a small quantity
of solid Carbon Compound
within the Exhausted Chamber
of an Electric Lamp for
~~our~~ Continuously supplying
Carbon

Case. BB.

The object of this invention is to make the resistance of Carbons filaments used in Electric Lighting by incandescence of an Even resistance

The invention consists in previously shaping Carbonizable matter in proper form Carbonizing the same under tension so as to retain its shape, and then measuring their resistance to the passage of a Current ~~sold~~ ~~Those Conductors~~ ~~the~~ Their resistance is then ~~brought~~ reduced in such a manner that all shall have nearly the same resistance after treatment A mould is formed similar to the shape of the carbon conductor to be heated. This mould may be either of nickel platina or Carbon preferably the latter as it can be cut out of paper & Carbonized in such a manner as to retain its shape, within the mould are placed a number of Carbons and ~~gas~~ a gas capable of decomposition by heat & depositing Carbon is

Case B13 2

passed through the mould while the same is [illegible] kept incandescent by the Electric Current. The Electric Current not being allowed to pass through the Carbons to be deposited upon. The length of time the mould is kept incandescent will determine the degree of deposit of Carbon and the consequent resistance of the Carbons upon which the deposit takes place. This is soon ascertained by experiment the high resistance Carbons requiring a longer time than the low resistance Carbons,

In fig 1 [illegible] B'C' BC is the mould, B' B the bottom & C' C the Cover. [illegible] within the mould are the several Carbons g to be acted upon, d' [illegible] is the inlet pipe for the gas & d the outlet pipe. When the gas has passed for some time the Current is passed through the mould by the pillars L & K and it is brought to the proper degree of incandescence

Case BB .. 3

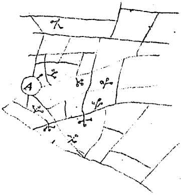
to decompose the liquid used ~~wh~~ and this is continued until the proper Resistance of the Carbons is attained which must have previously been ascertained by Experiment

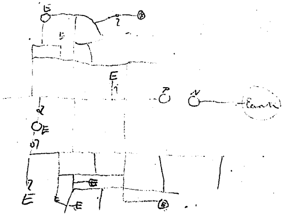
Afterwards the carbons are taken out & others put in place;

It is not essential that gas should be passed through the mould as a definite amount of solid crystals of Napthaline may be inclosed in the mould before heating and the Cover may be dispensed with if the mould be placed in an inclosing Chamber ~~entirely free from gas~~ filled with the gas to be decomposed,

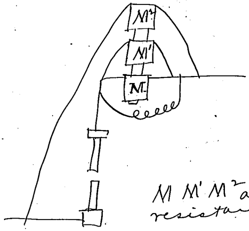
~~In~~ fig 2 shews a top view of the mould Fig-3. and End view

Claim, Method of evening the Res of filaments of Carbon by the deposit of Carbons upon ~~them~~ by the action of heat as set forth,




E
2
E
1
2
E
7
E
E
E
Earth

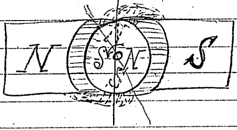
3828

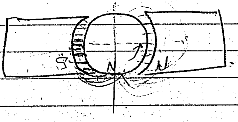


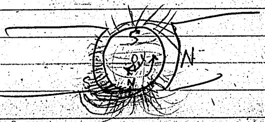
M M' M² all of same resistance.

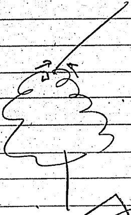
M² wound in opposite direction from M and M'

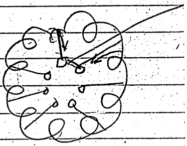
5/17 Spark due to cutting lines made by the magnetism of core due to current. This increases with load. Other lines constant.

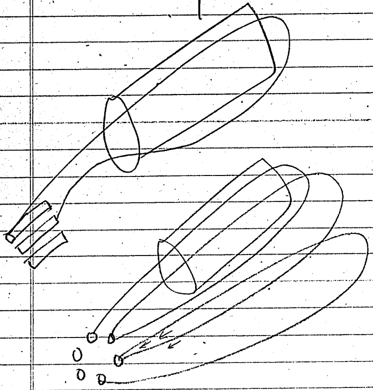


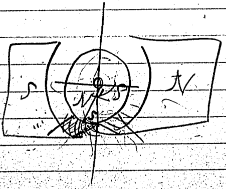








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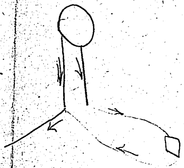
5-17



The Edison Electric Illuminating
Company of New York.
65 Fifth Avenue.

New York, 188

The object of this invention is to obtain a Economical and reliable meter adapted for measuring the amount of Electrical Energy consumed in my system of Electric Lighting =

The invention to which this relates is more particularly set forth in my application or patent = consists in using amalgamated Electrodes in the depositing cell, ~~instead of Copper electrodes~~ ~~to the End that [illegible]~~ from one of the Electrodes the metal is taken and deposited upon the other Electrode by the action of the Current,

By the use of amalgamated electrodes a much weaker Current will produce a more correct deposit of metal than is possible with Copper electrodes thus permitting of the use of a much smaller Resistance in the main line and

thus Causing a saving in Electrical Energy =
The Electrodes which I prefer to use and
which are the most accurate are of
Metallic Zinc, ~~all~~ both placed in a
strong solution of Sulphate of Zinc,
and Connected with the wires of the
System precisely in the manner shown
in my application or patent aforesaid,
and I prefer that such Electrodes
before being ~~used~~ in ~~a cell~~ the meter should
first have a heavy Coating of
deposited Zinc placed on them by
the action of a Current & thoroughly
amalgamated while being deposited
plates thus prepared are precisely
alike and give accurate results,
Other metals which can be amalgamated
such as Cadmium, Lead Tin, are capable
of being used in this Connection when

when immersed in the ~~sulphate~~ solutions of their ~~solut~~ salts, not acting upon the mercury such as the sulphate of Cadmium, acetate of Lead, but none are so accurate as Zinc treated & operated as described. an wire resistance is placed in the same shunt as the cells and arranged to compensate for the ~~rise or~~ Effect on temperature on the resistance of the cell. so that the total resistance of the shunt shall always be the same.

Claim

The use of an electro depositing cell provided with ~~Zn~~ amalgamated metallic plates, for determining the strength of the Electric Current which passes through it.

The Use of amalgamated Zinc Electrodes in an Electrodepositing Cell for determining the strength of the Current passing through it

3 = The ~~Use o~~ Combination with a definite & known resistance in an Electric circuit of a shunt circuit around such resistance containing ~~a dep~~ one or more electrodeposit cells ~~having~~ amalgamated metallic plates for determining the strength of the current in the main circuit —

Same Claim but with Zinc plates amalgamated

A meter for measuring the current in any ~~Multiple arc circuit~~ Electric circuit consisting of a known resistance in such circuit, around which is a shunt circuit, containing one or more electrodeposit cells ~~of~~ with amalgamated electrodes and resistances for compensating for the effect of temperature on the resistance of such cells —

The Edison Electric Illuminating
Company of New York.
65 Fifth Avenue.

New York, ____________ 188__

Dyer =

Did we get in that last English Meter Or on the Continent, that thermastatic device for keeping temperature above 50 fahr if not put ~~in the US application~~ show that, using same drawing as US, Want a/ take out Continental & English on this new deal as it settles the meter biz =

Form No. 22. 4, '81—1,000.

NO.

APPLICANT

LOCALITY

WANTED

Dips in sul. acid
then in merc.
Deposit in
sulphate of
Zinc - amalgamation
Dip again if
deposit is thick

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With copper continuous varies from
~~50~~ 1/50 to 1/100 of a volt -
Amal zinc about 1/1000 volt
Made no acid -
Amal zinc used in battery.

Zinc plates dont oxidize when
taken out -
Copper does - Cant amal-
gamate copper electrode
~~Cu plate a poor after deposit~~
Continue in solution.

Too a fract with [illegible]